

WHAT IS CLAIMED IS

1. A multi-phase alternating-current rotational electric machine comprising:

- 5 a housing,
 a rotor shaft rotatably installed in the housing,
 a magnetized rotor fixed to the rotor shaft,
 a stator which is arranged such that the windings of
the stator coil are wound around the stator core fixed to
10 the housing,
 multiple semiconductor switching devices, installed
in the housing, which adjust currents of the stator, and
 a heat sink fixed to the semiconductor switching devices
so that heat can be conducted, wherein
15 the semiconductor switching device is electrically
insulated from the heat sink, and the heat sink is grounded
to the housing as well as thermally separated in each phase.

2. A multi-phase alternating-current rotational electric machine comprising:

- 20 a housing,
 a rotor shaft rotatably installed in the housing,
 a magnetized rotor fixed to the rotor shaft,
 a stator which is arranged such that the windings of
the stator coil are wound around the stator core fixed to
25 the housing,

multiple semiconductor switching devices, installed in the housing, which adjust currents of the stator, and a heat sink fixed to the semiconductor switching devices so that heat can be conducted, wherein

5 the semiconductor switching device is electrically insulated from the heat sink, the heat sink is grounded to the housing, and the temperature of the multiple semiconductor switching devices is substantially determined in each phase.

10 3. A multi-phase alternating-current rotational electric machine according to Claim 1, wherein

multiple fins are arranged on the base surface of said heat sink and the substantially full flow of the air entering into said housing passes through the multiple fins.

15 4. A multi-phase alternating-current rotational electric machine according to Claim 1, wherein

multiple fins are arranged on the base surface of said heat sink and a cover, which has an opening almost identical to the projection of the heat sink in the direction of said rotor shaft, is provided.

20 5. A multi-phase alternating-current rotational electric machine according to Claim 1, wherein

the base surface of said heat sink is placed in parallel with the direction of the diameter of said rotor shaft.

25 6. A multi-phase alternating-current rotational

electric machine according to Claim 5, wherein

said multiple fins of said heat sink are concentrically arranged with said rotor shaft as the center.

5 7. A multi-phase alternating-current rotational electric machine according to Claim 1, wherein

said multiple fins located on the base surface of said heat sink are columnar and the multiple columnar fins are arranged on the base surface in a lattice-like configuration.

10 8. A multi-phase alternating-current rotational electric machine according to Claim 1, wherein

said multiple fins located on the base surface of said heat sink are columnar and the multiple columnar fins are arranged on the base surface in a staggered configuration.